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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,166	12/11/2001	Ghislain Imbert De Tremiolles	FR919990123US1/954-010350	2690

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EXAMINER	
WILLIAMS JR, RONALD E	

ART UNIT	PAPER NUMBER
2121	

DATE MAILED: 03/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	10/014,166	TREMIOLLES ET AL.	
	Examiner	**Art Unit**	
	Ronald E. Williams	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is responsive to application filed December 11, 2001.

2. Claims 1-23 have been examined.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 7-10, 13-16, and 19-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Bergstrom et al. **(USPN: 5,794,185)**.

Regarding Claim 1:

Method for encoding an input pattern **(see col. 4, lines 15-17. the input pattern is a speech signal)** of each of a succession of input signals **(see col. 5, lines 40-46)** using a normalizer **(see FIG. 1, lable 270 and col. 14, lines 59-67)** and a classifier **(see FIG. 3 and col. 5, lines 8-15)** during the learning phase **(see col. 5, lines 16-17 and lines 41-45)**, said input pattern being characterized by an essential feature or shape **(see col. 5, lines 29-32)** and at least one main parameter **(see col. 8, lines 30-33)** wherein said main parameter is an element susceptible of modifying the input pattern but not the shape, comprising the steps of:

- establishing a reference value **(see FIG. 1, label 180 and col. 9 lines 59-60)** for the main parameter; **(the mean of the single epoch is the reference value)**

- applying said input pattern for each of said succession of input signals **(see col. 5, lines 40-46)** to a normalizer that computes a main factor which measures the difference between the main parameter value of said input pattern and said reference value **(see col. 15, lines 16-22. subtract the input epoch from the mean value, i.e. "Main Parameter")** and that sets the input pattern at said reference value as a normalized pattern using said main factor;
- applying said normalized pattern for each of said succession of input signals **(see col. 5, lines 40-46)** and the category **(see FIG. 1, label 310 and col. 16, lines 61-64)** associated thereto by the user to a classifier; **(see FIG. 1, label 310 and col. 18, lines 51-55)(Degree of Periodicity Means contains a classifier- col. 4, lines 61-67) and (Encode Degree of Periodicity means contains Degree of Periodicity Means-col. 18, lines 51-54)** and,
- storing the normalized pattern **(see col. 16, lines 9-11)** of a first input signal of said succession of input signals **(see col. 5, lines 40-46)** in the classifier as a prototype; wherein said normalized pattern, said category and main factor **(see col. 16, lines 11-14. the offset is calculated as the difference between the mean value and the current input pattern)** represent the encoded pattern **(see col. 16, lines 56-64)**; and classifying individual ones of said input signals following first input signals by use of the stored prototype of said first input signal.

Regarding Claim 2:

The method of claim 1 wherein said at least one main parameter is a mean value and

said main factor consists of an offset used to shift the input pattern to said reference value. **(see col. 15, lines 10-22. the mean value is read from scalar mean vector and subtracted to produce zero mean epochs that is reference value, the main factor is the difference between the excitation waveform, input signal, and the mean value.)**

Regarding Claim 3:

The method of claim 1 wherein said at least one main parameter is the orientation of the input pattern **(see col. 15, lines 23-32. using deviation or main factor to produce a sequence of approximately unit variance contiguous epochs.)** and said main factor consists of a angle value used to rotate the input pattern to said reference value **(see col. 15, lines 59-66. the input pattern is correlated against the reference value to produce an oriented input pattern.)**.

Regarding Claim 4:

The method of claim 1 wherein said at least one main parameter is the amplitude of the input pattern **(see col. 8, lines 30-33. one of the spectral parameters corresponding to the segment of speech under analysis.)** and said main factor consists of a gain used to modify the input pattern to said reference value **(see col. 15, lines 61-67. cyclically shift the current epoch in order to maximize ensemble correlation with the ensemble mean, producing a zero-mean, unit variance, pitch-normalized,**

shifted epoch.).

Regarding Claim 7:

Method for encoding a new (unknown) input pattern **(see col. 4, lines 16-17. "input speech which originates from a human speaker." when input speech is originated from a human, it is considered to be unknown as opposed to being known when retrieved from a memory device. see col. 4, lines 17-18)** of each of a succession of input signals **(see col. 5, lines 40-46)** using a normalizer **(see FIG. 1, label 270 and col. 14, lines 59-67)** and a classifier **(see FIG. 3 and col. 5, lines 8-15)** during the classification phase, said new input pattern being characterized by an essential feature or shape and at least one main parameter wherein said main parameter is an element susceptible of modifying the new input pattern but not the shape, comprising the steps of:

- establishing a reference value **(see FIG. 1, label 180 and col. 9, lines 59-60)** for the main parameter **(the mean of the single epoch is the reference value)**;
- applying said new input pattern for each of said succession of input signals **(see col. 5, lines 40-46)** to a normalizer that computes a main factor which measures the difference between the main parameter value of said new input pattern and said reference value **(see col. 15, lines 16-22. subtract the input epoch from the mean value, i.e. "Main Parameter")** and that sets the input pattern at said reference value as a normalized pattern using said main factor;

- applying said normalized pattern for each of said succession of input signals **(see col. 5, lines 40-46)** to a classifier having normalized patterns stored therein as prototypes to generate the category, **(see col 5, lines 47-62)** wherein the normalized patterns stored in the classifier are obtained from normalized patterns of previous input signals in said succession of input signals **(see col. 5, lines 40-46. "a preferred embodiment of MLP classifier 27 was trained on a large database in excess of 10,000 speech frames in order to ensure good performance over a wide range of input speech data.").**

Regarding Claim 8:

The method of claim 7 wherein said at least one main parameter is of a mean value and said main factor consists of an offset used to shift the input pattern to said reference value. **(see col. 15, lines 10-22. the mean value is read from scalar mean vector and subtracted to produce zero mean epochs that is reference value, the main factor is the difference between the excitation waveform, input signal, and the mean value.)**

Regarding Claim 9:

The method of claim 7 wherein said at least one main parameter is the orientation of the input pattern **(see col. 15, lines 23-32. using deviation or main factor to produce a sequence of approximately unit variance contiguous epochs)** and said main factor consists of a angle value used to rotate the input pattern to said reference value **(see**

col. 15, lines 59-66. input pattern is correlated against the reference value to produce an oriented input pattern.).

Regarding Claim 10:

The method of claim 7 wherein said at least one main parameter is the amplitude of the input pattern **(see col. 8, lines 30-33. one of the spectral parameters corresponding to the segment of speech under analysis)** and said main factor consists of a gain used to modify the input pattern to said reference value **(see col. 15, lines 61-67. "cyclically shift the current epoch in order to maximize ensemble correlation with the ensemble mean, producing a zero-mean, unit-variance, pitch-normalized, shifted epoch.").**

Regarding Claim 13:

A method for decoding a new (unknown) input pattern **(see col. 7, lines 16-17. input speech which originates from a human speaker. When input speech is originated from a human, it is considered to be unknown as opposed to being known)** of each of a succession of input signals during the classification phase, said new input pattern being characterized by an essential feature or shape **(see col. 5, lines 29-32 and lines 50-53)** and at least one main parameter **(see col. 8, lines 30-33. the essential feature can be considered as the shape of the input signal not susceptible to change while the parameter values are susceptible to change)**

wherein said main parameter is an element susceptible of modifying the new input pattern but not the shape, comprising the steps of:

- establishing a reference value **(see FIG. 1, label 180 and col. 9, lines 59-60)** for the main parameter **(the mean of the single epoch is the reference value)**;
- applying said new input pattern to a normalizer that computes a main factor which measures the difference between the main parameter value of said new input pattern and said reference value **(see col. 15, lines 16-22. subtract the input epoch from the mean value, i.e. "Main Parameter")** and that sets the input pattern at said reference value as a normalized pattern using said main factor;
- applying said normalized pattern to a classifier having normalized patterns stored therein as prototypes to generate the category, wherein the normalized patterns stored in the classifier are obtained from normalized patterns of previous input signals in said succession of input signals **(see col. 5, lines 40-46)** , wherein said prototypes represent the codebook memory of the classifier **(see col. 4, lines 61-67)** and wherein said category and main factor are the identification data of said new input pattern **(see col. 16, lines 61-64);**
- applying said category to said codebook memory to extract the normalized pattern corresponding thereto **(see col. 20, lines 4-40);** and
- applying said normalized pattern and the main factor to a denormalizer to retrieve a pattern close to said new input pattern **(see col. 26, lines 5-28).**

Regarding Claim 14:

The method of claim 13 wherein said at least one main parameter is of a mean value and said main factor consists of an offset used to shift the input pattern to said reference value. **(see col. 15, lines 10-22. the mean value is read from scalar mean vector and subtracted to produce zero mean epochs that is reference value, the main factor is the difference between the excitation waveform, input signal, and the mean value.)**

Regarding Claim 15:

The method of claim 13 wherein said at least one main parameter is the orientation of the input pattern **(see col. 15, lines 23-32. using deviation or main factor to produce a sequence of approximately unit variance contiguous epochs.)** and said main factor consists of a angle value used to rotate the input pattern to said reference value **(see col. 15, lines 59-66. the input pattern is correlated against the reference value to produce an oriented input pattern.).**

Regarding Claim 16:

The method of claim 13 wherein said at least one main parameter is the amplitude of the input pattern **(see col. 8, lines 30-33. one of the spectral parameters corresponding to the segment of speech under analysis.)** and said main factor consists of a gain used to modify the input pattern to said reference value **(see col. 15, lines 61-67. "cyclically shift the current epoch in order to maximize ensemble**

correlation with the ensemble mean, producing a zero-mean, unit-variance, pitch-normalized, shifted epoch.").

Regarding Claim 19:

A system for encoding an input pattern **(see col. 4, lines 15-17. the input pattern is a speech signal.)**, said input pattern of each of a succession of input signals **(see col. 5, lines 40-45)**, said input pattern being characterized by an essential feature or shape **(see col. 5, lines 29-32 and lines 50-53)** and at least one main parameter **(see col. 8, lines 30-33)** wherein said main parameter is an element susceptible of modifying the input pattern but not the shape, comprising:

- means for applying the input pattern **(see col. 4, lines 16-17)** to a normalizer **(see col. 15, lines 16-22);**
- means for applying a category to an ANN **(see FIG. 1, label 310 and col. 18, lines 51-55)(Encode Degree of Periodicity Means contains a ANN)(category is produced by Calculate Degree of Periodicity and passed down to Encode Degree of Periodicity Means);**
- the normalizer **(see FIG. 1, label 270)** having a reference value for that parameter stored therein that computes a main factor which measures the difference between the main parameter value of said input pattern and a reference value **(see col. 15, lines 23-32. the standard deviation vector contains the difference between input parameter value and reference value**

or the main factor) thereof and that sets the input pattern at said reference value as a normalized pattern using said main factor **(see col 16, lines 33-36);**

- an ANN adapted to receive said normalized pattern **(see col. 18, lines 51-58. Encode Normalized Excitation Means produce normalized pattern to be received by Encode Degree of Periodicity that uses Calculate Degree of Periodicity which contains an artifical neural network- col. 4, lines 61-67)** and to store **(see col. 16, lines 9-11)** the normalized pattern in a neuron of the ANN as a prototype for analysis of subsequent input signals of said succession of input signals **(see col. 5, lines 40-46)** with the category associated thereto **(see col. 18, lines 51-58. Encode Ensemble Alignment Means characterize the normalized pattern based on the category or class outputted by Encode Degree of Periodicity);**
- wherein said normalized pattern **(see col. 16, lines 9-11)**, said category and main factor **(see col. 16, lines 11-14. the offset is calculated as the difference between mean value and the current input pattern)** represent the encoded pattern **(see col. 16, lines 56-64).**

Regarding Claim 20:

20. An identification system for encoding a new (unknown) input pattern **(see col. 4, lines 16-17)** of each of a succession of input signals **(see col. 5, lines 40-46)**, said input pattern being characterized by an essential feature or shape **(see col. 5, lines 29-32 and lines 50-53)** and at least one main parameter **(see col. 8, lines 30-33. the**

essential feature can be considered as the shape of the input signal not susceptible to change while the parameter values are susceptible to change) wherein said main parameter is an element susceptible of modifying the input pattern but not the shape, comprising:

- means for applying the new input pattern to a normalizer **(see FIG. 1, label 270 and col. 15, lines 10-22);**
- the normalizer **(see FIG. 1, label 270)** having a reference value for the parameter stored therein and computing a main factor which measures an offset difference between the main parameter value of said new input pattern and a reference value thereof **(see col. 15, lines 23-32. the standard deviation vector contains the difference between input parameter value and reference value or the main factor)**, and setting the new input pattern at said reference value as a normalized pattern using said main factor **(see col. 16, lines 33-36);**
- a classifier storing the normalized patterns **(see col. 16, lines 9-11. the memory corresponds to the classifier)** of individual ones of input signals of said succession of input signals that have been previously learned in the codebook thereof as prototypes, the prototypes serving for analysis of subsequent input signals of said succession of input signals **(see col. 5, lines 40-46)** with the category associated thereto adapted to receive said normalized pattern **(category relates to an essential feature previously defined)** from the normalizer to generate the category of the normalized pattern **(see col. 16, lines 56-64. the class corresponds to the category).**

Regarding Claim 21:

A retrieval system adapted to decode an new (unknown) input vector **(see col. 4, lines 16-17. the input pattern is a speech signal)** during the classification phase, the new input vector describing an input pattern of each of said succession of input signals **(see col. 5, lines 40-46)**, said input pattern being characterized by an essential feature or shape **(see col. 5, lines 29-32 and lines 50-53)** and at least one main parameter **(see col. 8, lines 30-33. the essential feature can be considered as the shape of the input signal not susceptible to change while the parameter values are susceptible to change)** wherein said main parameter is an element susceptible of modifying the input pattern but not the shape, comprising:

- means for applying the new input pattern to a normalizer; **(see FIG. 1, label 270 and col. 15, lines 10-22)**
- the normalizer **(see FIG. 1, label 270)** having a reference value for the parameter stored therein and computing a main factor which measures the difference between the main parameter value of said new input pattern and a reference value **(see col. 15, lines 23-32. the standard deviation vector contains the difference between input parameter value and reference value or the main factor.)** thereof and setting the new input pattern at said reference value as a normalized pattern using said main factor **(see col. 16, lines 33-36)**;
- a classifier storing the normalized patterns **(see col. 16, lines 9-11. the memory corresponds to the classifier)** of individual ones of input signals of said

succession of input signals **(see col. 5, lines 40-46)** that have been previously learned in the codebook thereof as prototypes with the category associated thereto adapted to receive said normalized pattern **(category relates to an essential feature previously defined)** from the normalizer to generate the category of the normalized pattern **(see col. 16, lines 56-64. the class corresponds to the category)**;

- means for applying the category of the normalized pattern to the codebook memory of the classifier **(see col. 20,lines 4-40)**;
- means for applying the main factor to a denormalizer **(see col. 26, lines 6-28)**;
- means for extracting the normalized pattern corresponding to that category from the codebook memory **(see col. 20,lines 4-40)**;
- a denormalizer adapted to receive said main factor and said normalized pattern to retrieve a pattern close to the original input pattern **(see col. 26, lines 6-28)**.

Regarding Claim 22:

The method of claim 1 is executed in a computer. Writing computer software product to execute a given algorithm or method can be done by anyone skilled in computer programming alone. There is no new patentable content or new limitation added to claim 1. Therefore, the rejection of claim 1 also applies to claim 22.

Regarding Claim 23:

The method of claim 7 is executed in a computer. Writing computer software product to

execute a given algorithm or method can be done by anyone skilled in computer programming alone. There is no new patentable content or new limitation added to claim 7. Therefore the rejection of claim 7 also applies to claim 23.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5-6, 11-12, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergstrom, as applied claims 1, 7, and 13 above respectively, in view of Steimle **(USPN: 6,377,941).**

Claims 5, 11, and 17

Bergstrom teaches a speech encoding and decoding method and apparatus with an artificial neural network (ANN) based classifier to receive input data. Bergstrom fails to teach a classifier using the input-space-mapping algorithm that computes the distance between input pattern and stored prototypes known as the K Nearest Neighbor (KNN) mode.

Steimle teaches methods and circuits of ANN that automatically computes the distance between input pattern and stored prototypes according to KNN mode. **(see col. 3, lines 60-67 and col. 4, lines 1-7)**

One of ordinary skill in the art would have provided the classifier, the learning system, taught by Steimle, for the purpose of computing the distance between input pattern and stored prototypes according to KNN mode. As a result it would have been obvious to one of ordinary skill in the art at the time of applicants' invention to modify the invention taught by Bergstrom by implementing the classifier using input space mapping algorithm based on KNN mode as taught by Steimle as set forth above.

Claims 6, 12, and 18

Bergstrom teaches a speech encoding and decoding method and apparatus with an artificial neural network (ANN) based classifier to learn input data. Bergstrom fails to implement the classifier using at least one ZISC neuron.

Steimle implements ANN circuits using ZISC neuron for the purpose of computing the minimum of the distance between an input vector and a prototype.

One of ordinary skill in the art would have used ZISC neuron as taught by Steimle for the purpose of computing the minimum distance between an input vector and a prototype. As a result it would have been obvious to one of ordinary skill in the art at the time of applicants' invention to modify the invention taught by Bergstrom as taught by Steimle as set forth above.

Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergstrom, as applied claims 1 and 7 above specifically, in view of Agarwal **(USPN: 5,279,691).**

Claims 22 and 23

Bergstrom teaches a speech encoding method to encode input signal. Bergstrom fails to each how to implement the method using a computer readable program code to execute each step in the methods.

Agarwal teaches a computer-implemented process, apparatus, and storage medium encoded with machine-readable computer program code for encoding input signals. **(see col. 2, lines 50-61)**

One of ordinary skill in the art would have used a computer program code for encoding input signals as taught by Agarwal, for the purpose of implementing encoding input signals method using computer program code. As a result it would have been obvious to one of ordinary skill in the art at the time of applicants' invention to modify the invention taught by Bergstrom as taught by Agarwal as set forth above.

Response to Arguments

While there may be a difference between the present invention and Bergstrom, this difference is not considered to be set forth within the claims. Whether one invention is more complex than the other is not a basis for patentability if the invention sought to be patented is claimed to be the same as the prior art. It is considered that the weights of Bergstrom are in essence a pattern. Any difference in normalization is not considered to be set forth in the claims; therefore, the claim is not considered patentable over Bergstrom. It should be noted that the training data of Bergstrom is a succession of

input data since the data must be input to the system. It is considered that the remaining claims are not patentable for the reasons set forth above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ronald E. Williams whose telephone number is 571 272 2590. The examiner can normally be reached on MWF 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 571 272 3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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